



October 28, 2013

Energy Policy Review Commission
100 Cambridge Street, 9th Floor
Boston, MA 02114

Attn: Lauren Farrell
RE: Public Comment – EPRC Report to the Legislature

Preamble

Alternative energy transportation technologies will change the energy landscape of the Commonwealth as Battery Electric Vehicles (BEV) and Fuel Cell Electric Vehicles (FCEV) take hold in our marketplace.

Massachusetts is a Chapter 177 State and that, by legislation, requires increasing percentages of automaker vehicle sales be Zero Emission Vehicles (ZEV).

Today automakers offer BEV (Battery Electric Vehicles). In 2015 four global auto makes will start the second phase by introducing commercial FCEV (Fuel Cell Electric Vehicles) to the market. The remaining auto industry will follow with FCEV offerings in 2016 and 2017.

BEV's are battery dominant vehicles which as they are driven deplete the battery charge. To replenish that charge, the vehicle is connected to the grid through either a slow or fast charge device. Driving range per charge is limited and is affected by the ambient temperature. Range is longer in the warm summer and shorter in the cold winter when the electric heater is in use. Consumers who are used to 300+ mile ranges between refueling find that affordable BEV ranges are less than 150 miles.

BEV range limitations have created a range anxiety amongst consumers which has slowed the growth of this type of vehicle. To extend the range per day, vehicle users look for charging stations at work, at retail stores and in commercial parking lots. While the number of charge locations is growing, it is not sufficient to support significant BEV market growth.

We suggest that the report take into account BEV grid power demand as market acceptance and adoption grow and as the state starts to enforce the ZEV mandate on the auto industry. The number of BEV's are low today, but the count is growing and as it does their impact on the grid will grow need consideration.

The auto industry has recognized a solution to range anxiety is required and plans to supplement the BEV vehicle platform with the FCEV platform. Fuel cell electric vehicles can be battery dominant with the fuel cell providing power for recharging the

batteries and for peaking purposes (similar in concept to that used by the Chevy Volt today). Or the FCEV can be fuel cell dominant with the battery providing the peaking power for acceleration. In this case, the FCEV recharges the battery when the vehicle is being operated at average speeds.

Holding back FCEV growth has been the availability of hydrogen refueling stations. Hydrogen can be made from a variety of sources – water using electrolysis – natural gas using reformation – biogas using reformation. There is a Working Group in Massachusetts developing programs enabling the construction of hydrogen fueling stations to allow fleet users to start purchasing and taking delivery of FCEV in 2015.

With a 400+ mile range per fill, there will be no market anxiety with FCEV. Consumer acceptance is expected to be much better with FCEV's than it has been with BEV. Lack of range anxiety coupled with stronger consumer acceptance will have a dramatic and positive effect on FCEV growth rates.

Comments on the EPRC Report to the Legislature

Issue One: Expanding Renewable Energy in the Commonwealth

The overview should include reference to renewable hydrogen generation in support of the coming FCEV and energy storage associated with offshore wind. FCEV hydrogen can be electrolyzed at night, stored and then distributed to retail hydrogen stations. Energy storage using either hydrogen or flow battery technology represents a further use of renewable energy offering peak coverage capability to the system.

Metrics should include reference to GHG reductions that are the result of BEV and FCEV miles driven when fueled by renewable power sources.

These technologies will reduce gasoline consumption thus improving our energy security.

Issue Two: Promoting Energy Efficiency in the Commonwealth

Consideration in the overview that market sales of BEV and FCEV offer more than 2X the efficiency of a conventional Internal Combustion Engine (ICE) vehicle should be given. The direct cost benefit is a substantial reduction in the consumption of hydrocarbon based transportation fuels and a lowering of GHG. As FCEV technology moves into the bus and trucking industry further GHG reductions will occur. Noise reduction benefits that enable better utilization of truck fleets on a 24x7 basis that have the potential to also reduce the number of trucks on the highways.

Metrics should include the GHG reduction by category of energy efficiency with at least one category referencing alternative energy transportation.

Issue Three: Encouraging Business Development and Job Creation in Massachusetts

Comment, as the alternative energy transportation market develops, the number of companies and workers associated with it will dwarf the number associated with solar and wind combined.

Job creation will include vehicle support & service roles, hydrogen infrastructure station construction, station operation and station maintenance roles, construction & support of auto dealer service facilities designed for FCEV service work.

Issue Four: Reducing Costs Associated with Energy Programs While Maximizing Benefits

As a subset of Metric #3, metrics should note and compare the energy outcome of specific programs and determine if the targeted result was achieved. If \$1 million was spent in a program to achieve a reduction of X energy did it do so? If not why not?

Within Metric #3 is a statement on the reduction of peak consumption. As more BEV's come to the market and are charged at work, at stores, in parking lots during daylight hours, there will actually be an offsetting effect on peak consumption.

Savings achieved through energy efficiency programs will be offset by the demand for power associated with charging of BEV's.

Issue Five: Reducing the Cost of Electricity for Commercial, Industrial and Residential Customers

The Overview references the potential change may be needed to increase the supply of natural gas. It does not indicate review was made of the resulting reductions in natural gas or other fuels through the use of CHP systems that harvest the free heat from the power generation process.

The review should also take into consideration the effective savings CHP and DG will bring as a result of the elimination of line losses associated with the distribution system.

Issue Six: Increasing Electricity Reliability

Energy security and grid reliability are issues important. Consumers all too frequently take it for granted that electricity will be available to us, regardless of the weather or situation. The programmatic impacts of Hurricane Katrina and Tropical Storm Sandy should be included in a review process.

Consideration of a metric covering the installation of renewable power generation for emergency response situations should be included. One example might be the installation of fuel cell back up power for cell tower which can operated for days rather than hours.

A review of police, fire and emergency management facility generators may be another metric. They currently utilize ICE generators that require periodic operation, are noisy, contribute to GHG and have no heat recovery.

Conversion to a fuel cell technology CHP system eliminates the periodic operation, has little or no noise, has more than 2X the efficiency thus saves fuel, offers a substantial GHG reduction and can provide heat for the facility.

Thank you for your consideration of our comments.

Sincerely,

Charles A. Myers
President
Massachusetts Hydrogen Coalition